

an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.

94. A projector according to claim 93, wherein said semiconductor island is a crystalline semiconductor island.

95. A projector according to claim 93, wherein said pixel electrode is transparent.

96. A projector according to claim 66, wherein said leveling film comprises organic resin.

97. A projector according to claim 93, wherein said leveling film comprises organic resin.--

REMARKS

The non-final Official Action dated January 2, 2002 has been received and its contents carefully noted. Filed concurrently herewith is a *Request for a Three Month Extension of Time* which extends the shortened statutory period for response to July 2, 2002. Accordingly, the Applicants respectfully submit that this response is being timely filed.

Applicants note with appreciation the consideration of the Information Disclosure Statements filed on April 8, 1999, December 3, 1999, March 7, 2000, May 4, 2000, July 28, 2000, December 12, 2000 and October 5, 2001.

Claims 9-16, 21-24, 33-36, 50-52, 54 and 57-65 were pending in the present application prior to the above amendment. Claims 9, 13, 21, 33 and 57-59 have been amended and new claims 66-97 have been added to recite additional protection to which the Applicants are entitled, of which claims 9, 13, 21, 33, 57-59, 66, 69, 73, 77,

81, 85, 89 and 93 are independent. Accordingly, claims 9-16, 21-24, 33-36, 50-52, 54 and 57-97 are now pending in the present application and, for the reasons set forth in detail below, are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraphs 1 and 2 of the Official Action rejects claims 9-12, 13-16, 21-24, 33-36, 50-52, 54 and 57-65 as obvious based on the combination of U.S. Patent No. 5,227,900 to Inaba et al. and JP 61-14174 to Takeshita et al., and refers to the Official Action dated June 5, 2001. The Applicants respectfully traverse the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2143-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Independent claims 9, 13, 21, 33, 57-59 and 66 have been amended to recite a liquid crystal material having ferroelectricity. Independent claims 9, 13, 21, 33, 57-59 and 66 further recite an organic resin film/leveling film formed over said first substrate to

provide a leveled upper surface over said first substrate, said organic resin film/leveling film covering said thin film transistor/semiconductor element; and a pixel electrode formed on said leveled upper surface, said pixel electrode being electrically connected to said thin film transistor/semiconductor element through an opening formed in said organic resin film/leveling film. Although Inaba recites a ferroelectric liquid crystal, the Official Action date June 5, 2001 concedes that Inaba does not teach or suggest "the organic resin film leveling layer and the pixel electrode formed on top of the leveling layer" (p. 2, Paper No. 21). The Official Action asserts that Takeshita teaches "that the usual way of forming a TFT is by forming a leveling layer" and that "it would have been obvious to one with ordinary skill in the art at the time of the invention was made to combine the leveling layer of Takeshita et al with the ferroelectric display of Inaba et al since, as taught by Inaba et al, this was well known" (Id.). However, the Official Action has not provided any specific teaching from either Inaba or Takeshita to indicate that it would have been desirable to modify the Inaba device by inserting the Takeshita leveling film between the substrate 30a and semiconductor film 26 of Inaba. Further, nothing in Inaba or Takeshita would instruct one with ordinary skill in the art to form an electrical connection between the pixel electrode 22 and the semiconductor film 26 of Inaba specifically through an opening formed in the Takeshita leveling film.

As noted in the Applicants' After Final Amendment filed October 5, 2001, Inaba and Takeshita fail to appreciate the problem caused by the narrow cell gap of the ferroelectric liquid crystal (FLC) or anti-ferroelectric liquid crystal (AFLC) display device, and the materiality of the flatness of the inside surface of the substrate in the FLC/AFLC display. The Official Action responded to the argument only by stating that limitations from the specification are not read into the claims. However, as noted above, the organic resin film or leveling film of the independent claims of the present invention is formed over said first substrate in order to provide a leveled upper surface over said first substrate. Inaba does not discuss the importance of a level or flat inside surface of the substrate, and, as noted above, there is no motivation in Inaba or Takeshita to modify

the Inaba device to include such a feature. Reconsideration of the rejection of independent claims 9, 13, 21, 33, 57-59 and 66 is respectfully requested.


With respect to new independent claims 69, 73, 77, 81, 85, 89 and 93, please incorporate all the arguments above with respect to the deficiencies in Inaba and Takeshita. Further, independent claims 69, 73, 77, 81, 85, 89 and 93 recite a liquid crystal material having anti-ferroelectricity. Inaba and Takeshita, either alone or in combination, do not teach or suggest forming an anti-ferroelectric liquid crystal display device. Therefore, the Applicants respectfully submit that new claims 69-97 are patentable over the prior art and are in condition for allowance.

In the present application, it is respectfully submitted that the prior art of record, alone or in combination, fails to expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

Accordingly, reconsideration and withdrawal of the rejection of independent claims 9, 13, 21, 33, 57-59, 66, 69, 73, 77, 81, 85, 89 and 93 under 35 U.S.C. § 103(a) is in order and respectfully requested. Likewise, it is believed that dependent claims 10-12, 14-16, 22-24, 34-36, 50-52, 54, 60-65, 67, 68, 70-72, 74-76, 78-80, 82-84, 86-88, 90-92 and 94-97 are likewise allowable in that they depend from what is believed to be allowable base claims 9, 13, 21, 33, 57-59, 66, 69, 73, 77, 81, 85, 89 and 93.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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Application Serial No. 09/285,899
Attorney Docket No. 0756-1950

MARKED-UP VERSION OF THE AMENDED CLAIMS

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9. (Amended) A device having at least one liquid crystal panel, said liquid crystal panel comprising:

a first substrate having an insulating surface;

a second substrate being opposed to the first substrate;

at least one thin film transistor being formed over the first substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

wherein the channel region, the source and drain region of said one thin film transistor is formed in a semiconductor island;

an organic resin film formed over said first substrate to provide a leveled upper surface over said first substrate, said organic resin film covering said thin film transistor;

a pixel electrode formed on said leveled upper surface, said pixel electrode being electrically connected to said thin film transistor through an opening formed in said organic resin film;

a liquid crystal material having ferroelectricity [or anti-ferroelectricity] and being formed between the first substrate and the second substrate;

an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.

13. (Amended) A device having at least one liquid crystal panel, said liquid crystal panel comprising:

a first substrate having an insulating surface;

a second substrate being opposed to the first substrate;

at least one semiconductor element being formed over the first substrate, said semiconductor element including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

wherein the channel region, the source and drain region of said one semiconductor element is formed in a semiconductor island;

an organic resin film formed over said first substrate to provide a leveled upper surface over said first substrate, said organic resin film covering said semiconductor element;

a pixel electrode formed on said leveled upper surface, said pixel electrode being electrically connected to said semiconductor element through an opening formed in said organic resin film;

a liquid crystal material having ferroelectricity [or anti-ferroelectricity] and being formed between the first substrate and the second substrate, and

an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.

21. (Amended) A television comprising:

a tuner for receiving television radio wave;

a liquid crystal panel operationally connected to said tuner, said liquid crystal panel comprising:

a first substrate having an insulating surface;

a second substrate being opposed to the first substrate;

at least one thin film transistor being formed over the first substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region and

a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

wherein the channel region, the source and drain region of said one thin film transistor is formed in a semiconductor island;

an organic resin film formed over said first substrate to provide a leveled upper surface over said first substrate, said organic resin film covering said thin film transistor;

a pixel electrode formed on said leveled upper surface, said pixel electrode being electrically connected to said thin film transistor through an opening formed in said organic resin film;

a liquid crystal material having ferroelectricity [or anti-ferroelectricity] and being formed between the first substrate and the second substrate;

an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.

33. (Amended) A portable computer having a liquid crystal panel, said liquid crystal panel comprising:

a first substrate having an insulating surface;

a second substrate being opposed to the first substrate;

at least one thin film transistor being formed over the first substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

wherein the channel region, the source and drain region of said one thin film transistor is formed in a semiconductor island;

an organic resin film formed over said first substrate to provide a leveled upper surface over said first substrate, said organic resin film covering said thin film transistor;

a pixel electrode formed on said leveled upper surface, said pixel electrode being electrically connected to said thin film transistor through an opening formed in said organic resin film;

a liquid crystal material having ferroelectricity [or anti-ferroelectricity] and being formed between the first substrate and the second substrate;

an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.

57. (Amended) A device having at least one liquid crystal panel, said liquid crystal panel comprising:

a first substrate having an insulating surface;

a second substrate opposed to said first substrate;

at least one thin film transistor formed over said first substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

wherein said channel region, said source and drain region of said one thin film transistor is formed in a semiconductor island;

a leveling film formed over said first substrate to provide a leveled upper surface over said first substrate, said leveling film covering said thin film transistor;

a pixel electrode formed on said leveled upper surface, said pixel electrode electrically connected to said thin film transistor through an opening formed in said leveling film;

a liquid crystal material having ferroelectricity [or anti-ferroelectricity] and being formed between said first substrate and said second substrate;

an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.

58. (Amended) A television comprising:

a tuner for receiving television radio wave;

a liquid crystal panel operationally connected to said tuner, said liquid crystal panel comprising:

a first substrate having an insulating surface;

a second substrate opposed to said first substrate;

at least one thin film transistor being formed over said first substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

wherein said channel region, said source and drain regions of said one thin film transistor is formed in a semiconductor island;

a leveling film formed over said first substrate to provide a leveled upper surface over said first substrate, said leveling film covering said thin film transistor;

a pixel electrode formed on said leveled upper surface, said pixel electrode electrically connected to said thin film transistor through an opening formed in said leveling film;

a liquid crystal material having ferroelectricity [or anti-ferroelectricity] and being formed between said first substrate and said second substrate;

an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.

59. (Amended) A portable computer having a liquid crystal panel, said liquid crystal panel comprising:

- a first substrate having an insulating surface;

- a second substrate opposed to said first substrate;

- at least one thin film transistor being formed over said first substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

- wherein said channel region, said source and drain regions of said one thin film transistor is formed in a semiconductor island;

- a leveling film formed over said first substrate to provide a leveled upper surface over said first substrate, said leveling film covering said thin film transistor;

- a pixel electrode formed on said leveled upper surface, said pixel electrode being electrically connected to said thin film transistor through an opening formed in said leveling film;

- a liquid crystal material having ferroelectricity [or anti-ferroelectricity] and being formed between said first substrate and said second substrate;

- an opposed electrode formed over said second substrate and opposed to said pixel electrode with said liquid crystal material interposed therebetween.